

M/S 532

OCT 25 1983

Alan Schuyler
Arco Alaska, Incorporated
Post Office Box 360
Anchorage, Alaska 99510

Dear Mr. Schuyler:

We have reviewed your request of August 31, 1983 for a waiver of the NSPS source test requirements for future Ruston TB-5000 turbines in the Prudhoe Bay and Kuparuk, Alaska oilfields. 40 CFR 60.8(b) allows EPA to grant such a waiver if the owner or operator of a source has demonstrated "to the Administrator's satisfaction that the affected facility is in compliance with the standard." We have concluded that source tests on future TB-5000 turbines are not required since identical turbines operated in these areas and using the same fuel have demonstrated compliance with the standard.

We do have some concerns regarding the granting of this waiver. We agree that the data are sufficient to demonstrate compliance with the 150 ppm NO_x emission limitation. However, we view the existing test data as representative of the expected variability in NO_x emissions from this model turbine. Unless we receive new test data or an expanded data base, future BACT determinations will necessarily have to reflect the variability in the existing data.

I also suggest that in the future, test plans and emissions test reports be submitted in a more timely manner. The test plans for 1983 were submitted less than 30 days prior to the scheduled source test date which caused undue hardship on our reviewers responding to the test plan. In the future, we must receive the test plan at least 30 days prior to the source test. In addition, the source test reports must be submitted within 45 days of the test date. This requirement is described in EPA Region 10's source test reporting requirements, a copy of which has been previously provided to you. In the case of the source test report submitted by ARCO on August 31, 1983, the report contained a relatively complete set of technical appendices, but did not include all of the information we would like to see. The missing information should include:

bc: Paul Boys, EPA

Final:Nye:kaf:10/24/83:#5076X

USEPA REG



0000007

CONCURRENCES

SYMBOL	RCN							
SURNAME	NYE							
DATE	10/24/83							

1. A comparison of the test results with the permit limitation (in units of the standard) should be included. For example, the turbine heat rating adjustment to the NO_x limitation was not calculated in your August 31, 1983 submittal nor was the CO emission rate expressed in the units specified in the permit.
2. Example calculations are helpful to show how the raw data were used to arrive at the end result. No example calculations were included in your report.
3. The derivation of equations which are not part of the EPA Methods should be included. For example, the equation used to calculate the NO_x mass emission rate (equation 3-1, p.6) should be included.
4. Although particulate testing was not required, it was done and the results included. Certain calibration data such as for the pitot tube coefficient, measured nozzle diameter, and meter box dry gas meter Y factor were not included.

If you have any questions please feel free to contact Raymond Nye of my staff (206) 442-7154.

Sincerely,

Michael M. Johnston, Chief
Air Operations Section

cc Lynn Billington, SOHIO
Dave Estes, ADEC
Kathy Pazera, AOO

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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letter.
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DATE: September 28, 1983

SUBJECT: ARCO/SOHIO Request for Waiver of the Compliance Test Requirement for the Ruston TB-5000 Turbine.

FROM: Paul Boys, Senior Chemical Engineer
Technical Support Team

SEP 29 RECD

TO: Mike Johnston, Chief
Air Operations SectionTHRU: Dan Bodien, Team Leader
Technical Support Team

This memo documents the conversations I had last week with ARCO/SOHIO concerning their request for a waiver of the compliance test requirement for the Ruston TB-5000 turbines. This request is contained in their August 31, 1983, letter to you. After investigating this question, I conclude that we could grant a compliance test waiver for the Ruston TB-5000 turbine; but I encouraged them to consider testing the TB-5000 turbine as scheduled (for the week of 9/19/83) since the incremental cost would be small and the data would be useful in helping to define the statistical variability of NO_x emissions for this model of turbine.

The reasons which lead to the above conclusion are listed below:

1. The data for two identical units installed and tested at the ARCO - Kuparuk operation showed NO_x emissions in the range of 60-77 ppm.
2. NO_x emissions data for the TB-5000 turbine from factory testing were also about 75 ppm.
3. OAQPS turbine experts (Gil Wood and Doug Bell) agreed that these data were sufficient to demonstrate compliance with the 150 ppm NO_x emission limitation. Since the question of statistical variability is not yet well defined for any particular model of turbine, the OAQPS personnel suggested that it would be desirable for the Company to do the testing even if a waiver was granted.

After my phone discussions with Alan Schuyler of ARCO and Lynn Billington of SOHIO, they agreed to test the TB-5000 turbine barring any unforeseen difficulties. Therefore, I suggest that we respond to their letter requesting the waiver affirmatively, but with a statement stating that we will view the existing test data as representative of the expected variability in NO_x emissions from this model of turbine unless we receive new test data. This point will be important in the determination of BACT for turbines of this size in future PSD permit applications.

I think two other issues should be included in our letter responding to ARCO and SOHIO. One is that in the future we expect to receive the

1/13/83 ARCO

emission test reports in a timely manner. The TB-5000 turbine tests at Kuparuk were conducted in May, 1983, but the reports were not sent to us until August 31, 1983. I think that 60 days from the test date is sufficient time to prepare and submit test reports.

Second, the test plans for 1983 were submitted less than 30 days prior to the scheduled test date (the SOHIO letter was dated 9/9/83 and the tests were scheduled to begin on 9/19/83). This caused considerable unnecessary commotion on our part in reviewing and responding to the test plan. It was especially troubling since we had to involve our contractor, PEDCO, who is located in Texas. I think we should remind them of the need to submit the test plans at least 30 days prior to the scheduled test date.

I have sent the turbine test reports back to OAQPS for their information in reviewing the NSPS and for their review of the test procedures and results. I also plan a more in-depth review of the reports. However, at this time they appear satisfactory and do demonstrate compliance with the PSD permit condition for 150 ppm NO_x.

If you have any questions about this response, please call me at 2-1567.

cc: Kathy Pazera, A00

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Wayne Ray

DATE: October 17, 1983

SUBJECT: Review of the Compliance Tests for the Arco-Kuparuk Ruston Turbines

FROM: Paul Boys, Senior Chemical Engineer
Technical Support Team

Paul

TO: Mike Johnston, Chief
An Operations Section

THRU: Dan Bodien, Team Leader
Technical Support Team

Paul Boys for

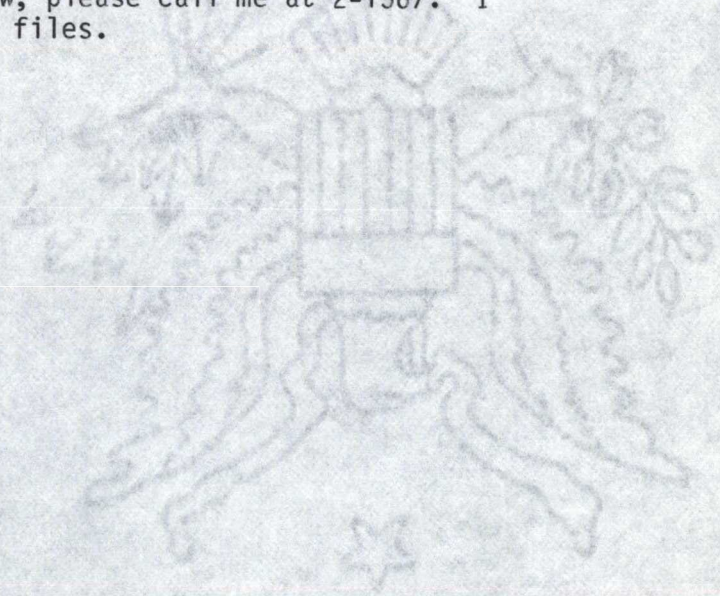
I have reviewed the source test report submitted August 31, 1983, by Arco for two Ruston TB-5000 turbines. In the Arco letter these are designated P2101A and B, but in the test report they are designated P2202A and B. Based on the data presented in the report compliance with the NO_x emission limitation in the permit (PSD-X82-01) was clearly demonstrated; however, there is some question whether compliance with the CO limitation has been demonstrated. The CO limitation is 109 lb/10⁶ cubic feet of gas fired. The average for turbine P2101 B was 86 lb/10⁶ scf and the average for the identical turbine P2101A was 126 lb/10⁶ scf. Averaging the two turbines together yields 106 lb/10⁶ scf. Therefore, if we evaluate each turbine individually (as the permit states) one is in compliance and one is out of compliance. If the two are averaged, however, the result is in compliance. Since CO was not the most critical pollutant and any attempt to reduce CO would probably increase NO_x, I recommend we allow the results of the two units to be averaged (for CO only). There was not as much variability in the NO_x results (61.7 vs 67.0 ppm). Both were well within the permit limitation of 150 ppm.

Although this report was done before Arco received your letter describing what we like to see in a source test report, I have listed below some of the deficiencies I noted which you may want to convey to Arco. This report contained a relatively complete set of technical appendices, but did not include all of the information I would like to see. The missing information included:

1. A comparison of the test results with the permit limitation (in units of the standard). For example, the turbine heat rating adjustment to the NO_x limitation was not calculated nor was the CO emission rate expressed in the units specified in the permit.
2. Example calculations are helpful to show how the raw data were used to arrive at the end result. No example calculations were included.
3. The derivation of equations which are not part of the EPA Methods should be included. For example, the equation used to calculate the NO_x mass emission rate (equation 3-1, p.6) should be included.


4. Although particulate testing was not required, it was done and the results included. Certain calibration data such as for the pitot tube coefficient, measured nozzle diameter, and meter box dry gas meter Y factor were not included.

If you have questions about this review, please call me at 2-1567. I have returned the test report for your files.



ARCO Alaska, Inc.
Post Office Box 360
Anchorage, Alaska 99510
Telephone 907 277 5637

BETTY - PLEASE
ENTER IN CDS
AS COMMENT
(SEE RAY FOR WHICH
SOURCE) THEN GET
TO PAUL BOYS ASAP
FOR HIS REVIEW



August 31, 1983

Mr. Mike Johnston
Chief, Air Operations Section
Region X
1200 Sixth Avenue
Seattle, Washington 98101

Mr. Leonard Verrelli
Air Quality Program Supervisor
Alaska Department of
Environmental Conservation
Pouch 0
Juneau, Alaska 99811

SUBJECT: Compliance Test Waiver Request
Ruston TB-5000 Turbine

Dear Gentlemen:

As provided in our PSD permits and the turbine New Source Performance Standards we are requesting a waiver of the NO_x compliance test required for any Ruston TB-5000 turbine, a 5000 horsepower unit. In support of this request, as per your letter of April 18, 1983, I have attached compliance test reports prepared for two identical TB-5000 Ruston turbines used to drive water injection pumps at the Kuparuk CPF-1. These tests were performed in May of 1983. In addition to these test results, I have included a copy of the factory tests performed on the TB-5000 at Ruston facilities in Lincoln, England.

The British tests indicate that operation of the TB-5000 at 100 percent maximum design rate results in emissions of 75 ppmv NO_x. Our compliance tests run at our full production rate (80 percent of design capacity) result in emissions of 60-67 ppmv NO_x. Under either level of operation, these emissions are one-half the emission limitation included in our PSD permits.

Due to the inclusion of a Ruston TB-5000 in this year's Prudhoe Bay Unit compliance test plan, I request your response to our waiver request before this year's tests which are due to be performed September 19-26, 1983.

• • • Compliance Test Waiver Request
August 31, 1983
Page 2

Please call me at (907) 263-4307 if you have any questions or require additional information.

Sincerely,



Alan J. Schuyler
Senior Engineer
Regulatory Compliance

AJS:tlh-0029

Attachments

cc: Steve Torok, EPA-Juneau - w/attachment